

EDITORIAL

Lead & Triple Cs- Children, Candies and Chocolates

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Whether it is a matter of birthday, passing an exam, Eid, marriage ceremony or any matter of celebration in our lives, without candies and chocolates it appears as if picture is without colors or a flower is without fragrance. Especially when it comes to children without candies and chocolates life appears incomplete. Children, candies and chocolates together make triple “Cs” and are interwoven like threads in a piece of cloth.

Lead is a naturally occurring heavy metal. A wide range of adverse effects could be induced in human beings depending upon the dose and time period of lead exposure.¹ Along with other heavy metals as cadmium and mercury, lead has no biological role.² It is considered a highly poisonous metal that can affect almost every organ and system in the body. The component limit of lead is documented as 1.0 µg/g. This represents the daily intake of lead an individual should have maximally. It is said that even at this low level, a prolonged intake can turn out to be dangerous and hazardous.³ Exposure to lead occurs primarily through ingestion, to a lesser extent through inhalation and occasionally by direct contact also.⁴

Foods, drinking water, lead paints, chocolates, candies are some of the sources that expose children. Children are more soft and sensitive targets to the effects of lead in comparison to adults.⁵ Children may suffer from learning disabilities resulting in a decreased intelligence known as decreased IQ, attention deficit disorder, behavior issues, nervous system damage, speech and language impairment, decreased muscle growth, decreased bone growth, kidney damage, abdominal cramps, constipation, sleep disturbances, headache etc.⁶ Problem is produced as heavy metals interact with essential metals and if, their metabolism is similar then they interfere with these essential metals, such as lead interacts with calcium in the nervous system and zinc present on heme enzymes.^{7,8} It acts as a calcium mimetic agent and crosses blood brain barrier. It then causes degradation of neuronal sheaths, interferes with neurotransmission routes, and decreases neuronal growth.⁹ Heavy metals as lead can interact with proteins, DNA and RNA and can affect or even stop their normal metabolism. They can also interact with unknown compounds thereby changing the physiologic processes.¹⁰ Harmful effects of heavy metals in the body when they are consumed above the recommended

limits, are known as bio-toxic effects. They are categorized as acute, chronic, sub-chronic, neurotoxic, carcinogenic, mutagenic, teratogenic etc., depending upon their presentation.¹¹

Epidemiological studies have documented that concentration of lead in blood even less than 5mcg/dL may cause subclinical problems related to cognition in young children exposed to this metal. Central nervous system in developing fetus and young children is well recognized as the most vulnerable target. Lead acts by blocking incorporation of iron into porphyrin IX. It also increases fragility of red blood cell membrane and thereby reduces their survival time. In this way lead can predispose to various types of anemia like normocytic, microcytic, hypochromic etc depending upon its concentration in blood.¹²

Devi and colleagues in India have recently highlighted that children are vulnerable to heavy metal contamination through consumption of candies and chocolates. Analysis by flame atomic absorption spectrometry has revealed an average concentration of Zn, Pb, Ni, and Cd to be 2.52±2.49, 2.0±1.20, 0.84±1.35, and 0.17 ± 0.22 µg/g respectively with cocoa-based candies at the top of the list. They have recommended that content of candies and chocolates should be monitored on regular basis especially for lead because children are very fond of both candies and chocolates and they are the ones highly susceptible to their adverse effects.¹³

“As You Sow”, a California-based health watchdog group in USA have documented in their recent survey that some chocolates contain 9 times the daily amount of lead. They analyzed fifty samples of different types of cocoa and found that more than half of them had lead and cadmium, and that too in levels exceeding the limits mentioned in California’s guidelines. This includes Cadbury’s Royal Dark Mini Eggs and Royal Dark Chocolate Bar, Godiva’s 72% and 50% cacao dark chocolate, and Hershey’s Special Dark chocolate.¹⁴

In food products, maximum limit as recommended by Food and Agricultural Organization (FAO) and by World Health Organization (WHO) for lead is 0.1ppm. Whereas analyses of forty six samples of flavored candies collected from whole sale markets of Karachi, showed a mean lead concentration of 1.9627. These candies are being sold openly at cheap affordable rates in low income areas of city particularly outside the schools, in small shops of residential areas and in the nearby markets.¹⁵

Unsafe storage conditions, improper raw materials, food additives, type of wrappers, ink used for packaging, metal contamination by utensils used during the preparation of candies and chocolates are factors promoting high level of heavy metals specifically lead in candies and chocolates.^{13,14}

The problem has been pointed out by the researchers around the globe. In the developed countries branded

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stuff is involved or we can say rightly that FDA and governmental guidelines are followed strictly, even then this big flaw has happened. Conversely it is reverse in our part of the world. In developing countries as Pakistan we probably are facing this menace double folded as branded chocolate stuff is not alone exposing our children but a great chunk is being added by the non-branded stuff that is available freely at low cost to our population without any proper regulatory procedure.

The point to ponder is any C of the Triple Cs-Children, Candies and Chocolates, is not detachable from the other two. Measures should be taken to keep all these "Cs" together in a good manner without compromising the health of the children.

Awareness among the community must be disseminated through print and electronic media regarding the use of only approved/ stamped candies and chocolates. Government, regulatory authorities, manufacturers, health care providers all should work together to build up and implement a system in true letter and spirit to safeguard our future generations.

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